

Claims:

1. A wire feed device for transporting a welding wire (13) from a wire storage to a point of consumption, including at least one element (28) for guiding the welding wire (13), wherein at least one element (28) including a guide path (32) is provided, along which several transport elements (33) are displaceably mounted, characterized in that at least one transport element (33) is connected with a drive means (37) and at least one further transport element (33) is connected with the welding wire (13) in a force-locking and/or form-locking manner, and that at least one element (28) is displaceably arranged for adaptation to the diameter of the welding wire (13).

2. A wire feed device according to claim 1, characterized in that at least one element (28) is displaceably arranged in a base body (29).

3. A wire feed device according to claim 1 or 2, characterized in that several elements (28) are provided.

4. A wire feed device according to claim 3, characterized in that three elements (28), which are preferably offset by an angle of 120°, are arranged about the welding wire (13).

5. A wire feed device according to any one of claims 2 to 4, characterized in that the base body (29) together with said at

least one element (28) is preferably centrally arranged in a drive sleeve (43), with the drive means (37) being formed by the drive sleeve (43).

6. A wire feed device according to claim 5, characterized in that the drive sleeve (43) is formed with an internal thread adapted to the contour of the transport element (33) and engaged by at least on transport element (33).

7. A wire feed device according to claim 6, characterized in that the internal thread of the drive sleeve (43), the base body (29) and the element (28) are preferably conically designed.

8. A wire feed device according to claim 6 or 7, characterized in that the base body (29) comprises a preferably cylindrical projection (42), which is mounted in the interior of the drive sleeve (43), preferably via a bearing assembly (44).

9. A wire feed device according to claim 8, characterized in that the base body (29), on its side located opposite the projection (42), comprises a preferably rectangularly designed positioning flange (45).

10. A wire feed device according to claim 9, characterized in that the positioning flange (45) is connected with a retention element (46) in a rotationally fast manner.

11. A wire feed device according to claim 10, characterized in that the drive sleeve (43) is connected with a coupling element (47), said coupling element (47) being arranged on the opposite side of the retention element (46).

12. A wire feed device according to claim 11, characterized in that the coupling element (47) or the drive sleeve (43) is directly connected with a drive (57), in particular electromotor.

13. A wire feed device according to claim 12, characterized in that the drive (57) is arranged axially to the wire feed device (27).

14. A wire feed device according to claim 13, characterized in that the drive (57) comprises a hollow shaft (58), which is connected with the coupling element (47) and through which the welding wire (13) is passable to the wire feed device (27).

15. A wire feed device according to any one of claims 12 to 14, characterized in that the drive (57), in particular a casing (59) of the drive (57), is connected with a further retention element (60) in a rotationally fast manner.

16. A wire feed device according to any one of claims 2 to 15, characterized in that a pressure element (61) is arranged in the base body (29) so as to be positioned between the positioning flange (45) and the element (28) and exert a pressure force onto

the element (28).

17. A wire feed device according to any one of claims 2 to 16, characterized in that the element (28) comprises a guide groove (38) and at least one guide pin (50) is arranged on the base body (29) to engage said guide groove (38) of the element (28).

18. A wire feed device according to any one of claims 1 to 17, characterized in that the transport element (33) is designed in the form of a ball.

19. A wire feed device according to any one of claims 5 to 18, characterized in that the drive sleeve (43) has an outer diameter (67) of between 20mm and 30mm.

20. A wire feed device according to any one of claims 1 to 19, characterized in that the wire feed device (27) is arranged in a welding torch (10) and/or welding apparatus (1).

21. A method for feeding a welding wire (13) from a wire storage to a point of consumption, wherein the welding wire (13) is guided through at least one element (28), and wherein several transport elements (33) are guided in at least one element (28) to circulate along a guide path (32), with at least one transport element (33) being in operative connection with the welding wire (13) on a side of the element (28) facing the welding wire (13), characterized in that, on at least one further side of the

element (28), at least one further transport element (33) is displaced by a drive means (37), thus causing the further transport elements (33) arranged in the guide path (32) to be moved on by said one transport element (33) displaced by the drive means (37), and that at least one element (28) is displaced for adaptation to the diameter of the welding wire (13).

22. A feeding method according to claim 21, characterized in that the element (28) is displaced in a base body (29), preferably in the longitudinal and/or vertical direction.

23. A feeding method according to claim 22, characterized in that several elements (28) are arranged in the base body (29).

24. A feeding method according to claim 22 or 23, characterized in that preferably three elements (28), which are offset by 120°, are arranged in the base body (29).

25. A feeding method according to any one of claims 22 to 24, characterized in that the base body (29), together with the element (28) arranged therein, is preferably centrically arranged in a drive sleeve (43) forming the drive means (37).

26. A feeding method according to claim 25, characterized in that at least one transport element (33) engages a thread (36) of the drive means (37), with the contour of the thread (36) being adapted to the contour of the transport element (33).

27. A feeding method according to claim 26, characterized in that the thread (36) of the drive sleeve (43), the base body (29) and the element (28) are preferably conically designed.

28. A feeding method according to claim 26 or 27, characterized in that the base body (29) comprises a preferably cylindrical projection (42), via which the base body (29) is mounted in the interior of the drive sleeve (43), preferably via a bearing assembly (44).

29. A feeding method according to claim 28, characterized in that the base body (29), on its side located opposite the projection (42), comprises a preferably rectangularly designed positioning flange (45).

30. A feeding method according to claim 29, characterized in that the positioning flange (45) is connected with a retention element (46) in a rotationally fast manner.

31. A feeding method according to claim 30, characterized in that a coupling element (47) is connected with the drive sleeve (43) on the opposite side of the retention element (46).

32. A feeding method according to claim 31, characterized in that the coupling element (47) or the drive sleeve (43) is directly connected with a drive (57), in particular electromotor.

33. A drive system according to claim 32, characterized in that the drive (57) is arranged axially to the wire feed device.

34. A feeding method according to claim 33, characterized in that the drive (57) is connected with the coupling element (47) via a hollow shaft (58) arranged in the drive (57), said welding wire (13) being fed through said hollow shaft (58).

35. A feeding method according to claims 32 to 34, characterized in that the drive (57), in particular a casing (59) of the drive (57), is connected with a further retention element (60) in a rotationally fast manner.

36. A feeding method according to any one of claims 22 to 35, characterized in that a pressure force is exerted on the element (28) by a pressure element (61) arranged in the base body (29) between the positioning flange (45) and the element (28).

37. A feeding method according to any one of claims 22 to 36, characterized in that at least one guide pin (50) arranged on the base body (29) engages a guide groove (38) of the element (28) and the element (28) is displaced via said assembly.

38. A feeding method according to any one of claims 21 to 37, characterized in that the transport element (33) is designed in the form of a ball.

39. A feeding method according to any one of claims 25 to 38, characterized in that the drive sleeve (43) has an outer diameter (67) preferably of between 20mm and 30mm.

40. A feeding method according to any one of claims 21 to 39, characterized in that the wire feed device (27) is preferably arranged in a welding torch (10) and/or welding apparatus (1).